

THERE IS CLAIMED:

1. A regenerator for an optical transmission system including a multiplexer coupling continuous light with transmitted signals, an intensity modulator modulating said transmitted signals and said continuous light and a Kerr fiber phase modulating said transmitted signals with the intensity-modulated continuous light by crossed phase modulation.
2. The regenerator claimed in claim 1 further including a filter downstream of said Kerr fiber for filtering said continuous light.
3. The regenerator claimed in claim 1 wherein said intensity modulator is a Mach-Zender modulator.
4. The regenerator claimed in claim 1 wherein said Kerr fiber has a non-linearity index greater than  $2.7 \times 10^{-20} \text{ m}^2/\text{W}$ .
5. The regenerator claimed in claim 1 wherein the chromatic dispersion of said Kerr fiber cancels out at a wavelength which is the average of the wavelengths of said transmitted signals and said continuous light.
6. The regenerator claimed in claim 1 wherein the depth of said intensity modulation is greater than 1 dB and preferably greater than 3 dB.
7. A regenerator for a wavelength division multiplex optical transmission system including:
  - a demultiplexer supplying demultiplexed channels at its output,
  - for each demultiplexed channel, a multiplexer coupling continuous light with the signals of said channel, an intensity modulator modulating said signals of said channel and said continuous light and a Kerr fiber phase modulating said transmitted signals with said intensity-modulated continuous light by crossed phase modulation, and
  - a multiplexer receiving said phase-modulated signals of each channel and supplying a multiplexed signal.
8. The regenerator claimed in claim 7 wherein said continuous light is supplied by a single source.
9. The regenerator claimed in claim 8 including an amplifier for amplifying said signals from said source.
10. The regenerator claimed in claim 7 wherein said intensity modulator is a Mach-Zender modulator.
11. The regenerator claimed in claim 7 wherein said Kerr fiber has a non-linearity index greater than  $2.7 \times 10^{-20} \text{ m}^2/\text{W}$ .

12. The regenerator claimed in claim 7 wherein the chromatic dispersion of said Kerr fiber for a channel cancels out at a wavelength which is the average of the wavelengths of said signals of said channel and said continuous light.
13. The regenerator claimed in claim 7 wherein the depth of intensity modulation in an intensity modulator is greater than 1 dB and preferably greater than 3 dB.
14. A fiber optic transmission system including a regenerator for an optical transmission system including a multiplexer coupling continuous light with transmitted signals, an intensity modulator modulating said transmitted signals and said continuous light and a Kerr fiber phase modulating said transmitted signals with the intensity-modulated continuous light by crossed phase modulation.
15. The system claimed in claim 14 further including a filter downstream of said Kerr fiber for filtering said continuous light.
16. The system claimed in claim 14 wherein said intensity modulator is a Mach-Zender modulator.
17. The system claimed in claim 14 wherein said Kerr fiber has a non-linearity index greater than  $2.7 \times 10^{-20} \text{ m}^2/\text{W}$ .
18. The system claimed in claim 14 wherein the chromatic dispersion of said Kerr fiber cancels out at a wavelength which is the average of the wavelengths of said transmitted signals and said continuous light.
19. The system claimed in claim 14 wherein the depth of said intensity modulation is greater than 1 dB and preferably greater than 3 dB.
20. A wavelength division multiplex fiber optic optical transmission system including a regenerator including:
- a demultiplexer supplying demultiplexed channels at its output,
  - for each demultiplexed channel, a multiplexer coupling continuous light with the signals of said channel, an intensity modulator modulating said signals of said channel and said continuous light and a Kerr fiber phase modulating said transmitted signals with said intensity-modulated continuous light by crossed phase modulation, and
  - a multiplexer receiving said phase-modulated signals of each channel and supplying a multiplexed signal.
21. The system claimed in claim 20 wherein said continuous light is supplied by a single source.
22. The system claimed in claim 21 including an amplifier for amplifying said signals

from said source.

- 23.** The system claimed in claim 20 wherein said intensity modulator is a Mach-Zender modulator.
- 24.** The system claimed in claim 20 wherein said Kerr fiber has a non-linearity index greater than  $2.7 \times 10^{-20} \text{ m}^2/\text{W}$ .
- 25.** The system claimed in claim 20 wherein the chromatic dispersion of said Kerr fiber for a channel cancels out at a wavelength which is the average of the wavelengths of said signals of said channel and said continuous light.
- 26.** The system claimed in claim 20 wherein the depth of intensity modulation in an intensity modulator is greater than 1 dB and preferably greater than 3 dB.
- 27.** An optical regeneration method including the following steps:
  - coupling continuous light with transmitted signals;
  - conjoint intensity modulation of said transmitted signals and said continuous light; and
  - phase modulation of said transmitted signals by crossed phase modulation with said intensity-modulated continuous light.
- 28.** The method claimed in claim 27 wherein said intensity modulation is effected with a modulation depth greater than 1 dB.
- 29.** The method claimed in claim 28 wherein said phase modulation is effected with a modulation depth of 3 dB.
- 30.** The method claimed in claim 27 including a step of filtering said intensity-modulated continuous light after said modulation step.